

changes and preserving their entirety, would change in themselves and become the productive sources of changes in the various mineral bodies composing their veins, or filling up their fractures. Again, its chalk beds would be converted into marble—its indurated limestones would assume the crystalline texture—its clays would concrete into nodules of quartz, mica, felspar, and other compounds, and its verdant forests would disappear, giving place to trees, plants, and grasses of another nature, and of a nobler growth.

(To be continued.)

METROPOLITAN IMPROVEMENTS.

(Continued from p. 231.)

THE PLAN OF MR. PAGE.

The principles of Mr. Page's plan are distinct in character from those of Mr. Walker, and, in some respects, opposed to them. It proposes an embankment with side channels, the embankment of itself forming a continuous public terrace. Assuming every abstraction of tidal water from a navigable river to be injurious to the navigation below the locality of the embankment, by depriving a portion of the river of its scour, Mr. Page proposes, first, to avoid encroaching upon the capacity of the river for the reception of its tidal waters, and to make the prevention of encroachments at any future period, as far as practicable, a leading feature. Secondly, to leave to the wharfingers and others interested in the trade of the locality the possession of their present accommodations on the river shore; and, thirdly, to provide increased facilities of communication between the east and west ends of town by a public road constructed in the river.

The details of a plan professing to be founded upon these principles must, it is obvious, be far more extensive and complicated in their character than those of any plan based upon an alternation of solid embankments and recesses only. A river-wall interposed between the navigable channel and the shore must have openings to afford facilities of intercourse between the two; the position of these openings would form one subject for inquiry—their width, another—the facilities of access at different states of the tide, another. These openings could, of course, be passable only by bridges; and those bridges, in accordance with one of the leading principles of Mr. Page's plan, should be of sufficient width and height to admit of the accustomed traffic of any locality at any state of the tide. On the other hand, Mr. Page's terrace was to pass under the respective bridges which connect the Middlesex and Surrey shores of the river; and hence it would appear impossible entirely to satisfy one of these conditions without conflicting, in some measure, with the other.

Another point, the importance of which was not to be overlooked, was the convertibility of these side channels into docks or floating basins. The treatment of this question involved the discussion of locks, their position, their capabilities, their size, and their probable cost. The relative advantages of tidal docks and floating basins, in reference to the trade and the navigable interests of the river; the supervision necessary to the regulation of either; their respective tendencies to silt, and the facilities for cleansing and keeping them free from mud, furnished further subject for inquiry; and, the commissioners are compelled to add, for much conflicting opinion.

Of the plan before the commission a copy will be found inserted in the appendix, together with a statement of its objects and alleged advantages, drawn up by Mr. Page at our suggestion. As its features were comparatively new, and as we had not before us, as in the consideration of Mr. Walker's plan, a body of existing evidence to refer to, we were induced by these and the causes previously mentioned to examine Mr. Page at great length, and to enter minutely into detail on matters some of them exclusively technical in their character, and to which therefore it is scarcely necessary to refer in this report, except as to their relative importance to, and bearing upon the main subject of inquiry.

Looking to the principles which Mr. Page assumes as forming the basis of his plan, its consideration may be divided, as stated by himself, under three heads; viz.—

1. As any embankment constructed upon

these principles may affect the Thames as a navigable river.

2. As it may affect the wharfingers and other proprietors on its banks; and

3. As it may improve the means of communication in the metropolis by opening new facilities for traffic, and for promoting generally the health and convenience of the public.

The first of these considerations opened of itself an extensive field of inquiry, and involved a class of interests not so much connected with the locality immediately concerned as with the Pool and lower portions of the river. We trust that the magnitude and importance of these interests have not been forgotten.

The abstraction of the tidal water from a river, wherever an embankment is projected upon its shores, and the prejudicial consequences necessarily arising from that abstraction, are topics upon which, of course, this commission can be competent to express an opinion only upon the evidence before it. The expediency of maintaining, if not increasing the volume of tidal water in the higher portions of the Thames, is stated by Mr. Page to have suggested a leading feature of his plan, and many of the letters and papers already referred to as inserted in the appendix to this report are addressed to this interesting but necessarily difficult branch of the inquiry. Of the soundness of the principle which it is the object of these papers to enforce, and looking to the embankment of the locality under consideration as part only of a larger system of improvement, which is at this moment professed to be in operation in various parts of the river, of its great practical value, we can entertain no doubt whatever; and, if the evidence before us is not altogether so concurrent as might have been desired as to its application to that particular locality, irrespective of other portions of the river, yet the very conflict of opinions has had its use in impressing upon us the necessity of caution.

The plan under consideration was, of course, open to little positive objection on this head. Captain Maughan, indeed, considered even Mr. Page's embankment as involving *prima facie* a violation of his own principle, inasmuch as it would displace by its own bulk a portion of that water, and, *pro tanto*, abstract it from the scour of the river below. In the letter, however, addressed by Captain Maughan to the chairman of the commission, he observes, that, assuming the water in the side channels "to pass in and out with the tide, Mr. Page's plan, compared with the other plans, would curtail in a lessened degree the tidal water: while one of his propositions being to remove the mud-banks and other inequalities of the river above low-water mark, it is probable that the cubic spaces so gained would equal those lost by the terraces, and that thus the river below would sustain no injury."

Its merits, therefore, are to be tested, in the first instance, with reference to the trade of the river shore. The principle objection to which it is obnoxious may perhaps be best stated in the words of Mr. Harvey, a general wharfinger, in considerable trade, occupying the Grand Junction Wharf, Whitefriars:—"I consider that any obstruction, whether by wall or otherwise, which would prevent me from getting my barge into the stream, at any time while she was afloat, would be a disadvantage. The embankment itself would be an obstruction; wherever a barge lies now, whether we want to go up or down, we have only to put her astern and get into the stream. If there is a flood-gate, and we have to go out at one particular spot, we must accommodate the other craft, so as to come out at that particular place. At present it requires a good deal of contrivance to place a large barge alongside of our wharf; and, if the room were much lessened, it would be almost impracticable." To a question whether his objections were confined to the inconvenience of access, he replied, "The inconvenience of access is one point. Then it shortens my water-way. If the embankment take place outside what we consider our present water-way, I could not of course complain, except as to the impediment of access." Mr. Pocock, the owner of an extensive coal-wharf in the same neighbourhood, concurred in these objections of Mr. Harvey. The outer pile of Mr. Harvey's wharf was stated to be 160

feet—that of Mr. Pocock's wharf to be from 180 to 190 feet from the shore; the space assigned to these wharfs, upon Mr. Page's plan, was about 140 feet; the space usually granted by the city, according to Mr. Richard Lambert Jones, from 70 to 100 feet.

A further reference, however, to the evidence of Mr. Jones on this point may help to clear up much of this difficulty. In reference to Mr. Page's plan, he observes, "I dare say the coal merchants would say, at first starting, that there is not sufficient room for them; for I know enough of the applications by the various coal merchants to the corporation of London to put piles in, and to have what they called floating craft; but we never can confine them to that; though they may ask for one pile, they will carry it further out. We confine them that they shall not come out more than five or six craft into the river; and they will take the liberty of having seven or eight; that is, they make the warehouses for coals on the river, instead of having them on the land, as they are at Liverpool and other outports; it is the cheapest warehouse they can get."

Mr. Tayler, on the other hand, of the firm of Dalgleish and Tayler, coal merchants and general wharfingers in Scotland-yard, to a question as to the bearing of this plan of embankment on their interests as wharfingers, replied,—"I should rather have the river (speaking of it as merely connected with our business) as it is. It would give us a great deal more trouble getting out and in of this dock; it would impede our business a little, but I think not to a material degree." These gentlemen are the occupiers of two wharfs adjoining to each other, at which the average number of these barges is about 30, the mooring room at one of them alone being sufficient for 53.

Of the professional opinions obtained by the commission upon this part of the question there were none addressed directly to the reasonable sufficiency of Mr. Page's inner water-way. No doubt, however, as to its sufficiency is expressed by these gentlemen in the discussion of any portions of Mr. Page's plan, or of the modifications of which it was represented to be susceptible; and the commission think it will be clear, from the general tenor of their evidence, that no such doubt was entertained.

The evidence of these gentlemen as to the merits of the plan under consideration, as it would affect the wharfingers and other proprietors on the bank of the river, involved questions of detail upon which it was necessarily difficult for the commission to obtain, or indeed for them to give, direct and unqualified answers. Having no personal interests to serve, the tendency of their evidence was rather to suggest alterations than to take objections, upon all the really practical parts of the inquiry. The reply of Captain Maughan to one of the questions affords an illustration of this statement:—"Mr. Page's plan," he observes, "admits of two modes of application,—either with open entrances (or entrances open only during particular periods of the tide), or locks, which would make his side channels floating basins; but the object of it, I understand, is to leave the wharfs as they are at present, and otherwise to meet the exigencies of the trade, whichever mode of entrance may be more convenient;" and the bulk of the evidence on this point is accordingly associated with one or other of the modes of application above adverted to.

FIRE-PROOF ARCHITECTURE, GLANTON-HURDY.—The kitchen is a very curious example of domestic architecture, of comparatively recent date; the following story is told of its origin:—Henry VIII. one day said to the abbot, who had offended him, but professedly in reproof of the sensual indulgences which he appeared to believe disgraced the monastery, that he would burn the kitchen; upon which the abbot haughtily replied that he would build such a kitchen that not all the wood in the royal forest should be sufficient to carry the threat into execution; forthwith he built the existing structure.—*Knight's "Old England."*

The British Association for the Advancement of Science will assemble in York on the 26th, 27th, 28th, and 30th of September, and on the 1st and 2nd of October next.